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Interventions and Management

1. Development of the Hand Assessment for Infants: evidence of internal scale validity.

Krumlinde-Sundholm L, Ek L, Sicola E, Sjöstrand L, Guzzetta A, Sgandurra G, Cioni G, Eliasson AC.

Dev Med Child Neurol. 2017 Oct 6. doi: 10.1111/dmcn.13585. [Epub ahead of print]

AIM: The aim of this study was to develop a descriptive and evaluative assessment of upper limb function for infants aged 3 to 12 months and to investigate its internal scale validity for use with infants at risk of unilateral cerebral palsy. **METHOD:** The concepts of the test items and scoring criteria were developed. Internal scale validity and aspects of reliability were investigated on the basis of 156 assessments of infants at 3 to 12 months corrected age (mean 7.2mo, SD 2.5) with signs of asymmetric hand use. Rasch measurement model analysis and non-parametric statistics were used. **RESULTS:** The new test, the Hand Assessment for Infants (HAI), consists of 12 unimanual and five bimanual items, each scored on a 3-point rating scale. It demonstrated a unidimensional construct and good fit to the Rasch model requirements. The excellent person reliability enabled person separation to six significant ability strata. The HAI produced an interval-level measure of bilateral hand use as well as unimanual scores of each hand, allowing a quantification of possible asymmetry expressed as an asymmetry index. **INTERPRETATION:** The HAI can be considered a valid assessment tool for measuring bilateral hand use and quantifying side difference between hands among infants at risk of developing unilateral cerebral palsy. **WHAT THIS PAPER ADDS:** The Hand Assessment for Infants (HAI) measures the use of both hands and quantifies a possible asymmetry of hand use. HAI is valid for infants at 3 to 12 months corrected age at risk of unilateral cerebral palsy.

[PMID: 28984352](#)

2. Effects of Visual Manipulation in Sit-to-Stand Movement in Children With Cerebral Palsy.

Pavão SL, Arnoni JLB, Rocha NACF.

J Mot Behav. 2017 Oct 4:1-6. doi: 10.1080/00222895.2017.1367641. [Epub ahead of print]

The authors sought to verify the effects of vision on sit-to-stand (STS) movement performance by means of postural sway in children with cerebral palsy (CP) and typical children (TC). Participants were 42 TC and 21 children with CP. STS movement was assessed with eyes open and with eyes closed. Area and velocity of center of pressure sway were analyzed in each of the 3 STS phases. We observed greater postural sway during STS movement with eyes closed. Children with CP presented greater postural sway than TC did. Both groups exhibited greater postural instability with absence of vision expressing the role of vision to keep postural stability. Moreover, the greater postural instability was observed in children with CP.

[PMID: 28976286](#)

3. Neuromuscular scoliosis complication rates from 2004 to 2015: a report from the Scoliosis Research Society Morbidity and Mortality database.

Cognetti D, Keeny HM, Samdani AF, Pahys JM, Hanson DS, Blanke K, Hwang SW.

Neurosurg Focus. 2017 Oct;43(4):E10. doi: 10.3171/2017.7.FOCUS17384.

OBJECTIVE Postoperative complications are one of the most significant concerns in surgeries of the spine, especially in higher-risk cases such as neuromuscular scoliosis. Neuromuscular scoliosis is a classification of multiple diseases affecting the neuromotor system or musculature of patients leading to severe degrees of spinal deformation, disability, and comorbidity, all likely contributing to higher rates of postoperative complications. The objective of this study was to evaluate deformity correction of patients with neuromuscular scoliosis over a 12-year period (2004-2015) by looking at changes in postsurgical complications and management. **METHODS** The authors queried the Scoliosis Research Society (SRS) Morbidity and Mortality (M&M) database for neuromuscular scoliosis cases from 2004 to 2015. The SRS M&M database is an international database with thousands of self-reported cases by fellowship-trained surgeons. The database has previously been validated, but reorganization in 2008 created less-robust data sets from 2008 to 2011. Consequently, the majority of analysis in this report was performed using cohorts that bookend the 12-year period (2004-2007 and 2012-2015). Of the 312 individual fields recorded per patient, demographic analysis was completed for age, sex, diagnosis, and preoperative curvature. Analysis of complications included infection, bleeding, mortality, respiratory, neurological deficit, and management practices. **RESULTS** From 2004 to 2015, a total of 29,019 cases of neuromuscular scoliosis were reported with 1385 complications, equating to a 6.3% complication rate when excluding the less-robust data from 2008 to 2011. This study shows a 3.5-fold decrease in overall complication rates from 2004 to 2015. A closer look at complications shows a significant decrease in wound infections (superficial and deep), respiratory complications, and implant-associated complications. The overall complication rate decreased by approximately 10% from 2004-2007 to 2012-2015. **CONCLUSIONS** This study demonstrates a substantial decrease in complication rates from 2004 to 2015 for patients with neuromuscular scoliosis undergoing spine surgery. Decreases in specific complications, such as surgical site infection, allow us to gauge our progress while observing how trends in management affect outcomes. Further study is needed to validate this report, but these results are encouraging, helping to reinforce efforts toward continual improvement in patient care.

[PMID: 28965448](#)

4. Anterior or posterior walkers for children with cerebral palsy? A systematic review.

Poole M, Simkiss D, Rose A, Li FX.

Disabil Rehabil Assist Technol. 2017 Oct 6:1-12. doi: 10.1080/17483107.2017.1385101. [Epub ahead of print]

OBJECTIVE: To review the literature comparing use of anterior and posterior walkers (PW's) by children with cerebral palsy (CP) to determine which walker type is preferable. **METHODS:** Electronic databases were searched using pre-defined terms by two independent reviewers. Reference lists of included studies were hand searched. Studies published between 1985 and 2016 comparing use of anterior and PW's by children with CP were included. All study designs and outcomes were accepted. Risk of bias was assessed using the "Quality assessment standard for a cross-over study". Quality of evidence was evaluated using GRADE. **RESULTS:** Six studies were analysed. All studies had small sample sizes. A total of 4/6 studies were randomized. A total of 4/6 had high risk of bias. Outcomes included velocity, pelvic tilt, hip flexion, knee flexion, step length, stride length, cadence, double stance time, oxygen cost and participant/parental preference. Velocity, trunk flexion/pelvic tilt, and stability may be improved by using a PW, however, GRADE quality was very low for all outcomes and there was heterogeneity between studies. The majority of participants and parents preferred the PW. **CONCLUSIONS:** Heterogeneity and low quality of existing evidence prevented recommendation of one walker type. Well-designed studies with adequate power are needed to inform clinical recommendations. Implications for rehabilitation Clinical recommendations cannot be made for whether anterior or posterior walkers are preferable for children with cerebral palsy based on the existing evidence. Velocity, trunk flexion/pelvic tilt, and stability may be improved by using a posterior walker. The majority of walking aid users and their parents preferred posterior walkers. Adequately powered studies designed to minimize bias are needed.

[PMID: 28984507](#)

5. Correction: Immediate Effect of a Single Session of Whole Body Vibration on Spasticity in Children With Cerebral Palsy.

Park C, Park ES, Choi JY, Cho Y, Rha DW.

Ann Rehabil Med. 2017 Aug;41(4):722-723. doi: 10.5535/arm.2017.41.4.722. Epub 2017 Aug 31.

[This corrects the article on p. 273 in vol. 41, PMID: 28503461.].

Erratum for
Immediate Effect of a Single Session of Whole Body Vibration on Spasticity in Children With Cerebral Palsy. [Ann Rehabil Med. 2017]

[PMID: 28971060](#)

6. Quantitative 3-D Ultrasound of the Medial Gastrocnemius Muscle in Children with Unilateral Spastic Cerebral Palsy.

Obst SJ, Boyd R, Read F, Barber L.

Ultrasound Med Biol. 2017 Sep 26. pii: S0301-5629(17)31290-5. doi: 10.1016/j.ultrasmedbio.2017.08.929. [Epub ahead of print]

Three-dimensional ultrasound (3-DUS) was used to examine the size and appearance of the medial gastrocnemius (MG) muscle in children with unilateral cerebral palsy (CP). Twenty-six children with CP and 10 typically developing (TD) children participated. Three-dimensional US images of both limbs in children with CP and the right limb in TD children were analysed using quantitative methods to determine muscle volume, global echo intensity, global echo pattern and regional echo intensity. Significant differences in MG volume and all echo parameters were found between TD and CP children. The more involved limb was smaller and had higher echo intensity and a more heterogenous echo pattern compared with the TD group. Compared with that of the more involved limb, the MG of the less involved limb was larger but had a similar echo appearance. The MG of both limbs in children with unilateral spastic CP is smaller and, based on quantitative ultrasound, structurally different from that of TD children.

[PMID: 28967503](#)

7. Validity and reliability of ankle dorsiflexion measures in children with cerebral palsy.

Kim DH, An DH, Yoo WG.

J Back Musculoskelet Rehabil. 2017 Sep 22. doi: 10.3233/BMR-170862. [Epub ahead of print]

PURPOSE: We compared a goniometer method in a non-weight-bearing position with a tape measure method in a weight-bearing position to determine which was more reliable for assessing dorsiflexion range of motion (ROM) in children with cerebral palsy (CP). **METHODS:** Ankle dorsiflexion ROM was measured using goniometer and tape measure methods in non-weight- and weight-bearing positions, respectively. **RESULTS:** In the test-retest reliability of ankle dorsiflexion ROM using a universal goniometer, the intraclass correlation coefficient (ICC) varied from 0.75 to 0.96 and the overall ICC score was 0.91 ($p < 0.001$). In the test-retest reliability of ankle dorsiflexion ROM using a tape measure, ICC varied from 0.98 to 0.99 and the overall ICC score was 0.99 ($p < 0.001$). Ankle dorsiflexion ROM using a universal goniometer had a standard error of measurement (SEM) of 2.86 and a minimum detectable change (MDC) of 7.94. Ankle dorsiflexion ROM using a tape measure had an SEM of 1.01 and a MDC of 2.80. **CONCLUSIONS:** The tape measure method in a weight-bearing position was more reliable than using a universal goniometer in a non-weight-bearing position in children with CP.

[PMID: 28968229](#)

8. Conservative treatment for equinus deformity in children with cerebral palsy using an adjustable splint-assisted ankle-foot orthosis.

Chen W, Liu X, Pu F, Yang Y, Wang L, Liu H, Fan Y.

Medicine (Baltimore). 2017 Oct;96(40):e8186. doi: 10.1097/MD.00000000000008186.

BACKGROUND: A novel splint, the assisting ankle-foot orthoses (AFO), was developed to provide adjustable sustained stretching to improve conservative treatment for equinus deformities in children with cerebral palsy (CP). The treatment effect was validated by follow-up visits. **METHODS:** This study involved subjects between 2 and 12 years old, including 28 CP children treated with splint-assisted AFO correction, 30 CP children treated with static AFO correction, and 30 normal children with typical development (TD). Quantitative pedobarographic measurements were taken to evaluate the effect of splint-assisted AFO correction. The heel/forefoot ratio was introduced to indicate the degree of the equinus deformity during treatment. **RESULTS:** The results showed that the heel/forefoot ratios were 1.41 ± 0.26 for the TD children; 0.65 ± 0.41 , 1.02 ± 0.44 , and 1.24 ± 0.51 for the splint-assisted AFO correction before and after 6-month and 12-month treatments; 0.59 ± 0.37 , 0.67 ± 0.44 , and 0.66 ± 0.42 for the static AFO correction before and after 6-month and 12-month treatments. **CONCLUSIONS:** This study suggests that correction with the adjustable splint-assisted AFO is an effective treatment for equinus deformity in CP Children.

[PMID: 28984769](#)

9. Asynchronous brain-computer interface for cognitive assessment in people with cerebral palsy.

Alcaide-Aguirre RE, Warschausky SA, Brown D, Aref A, Huggins JE.

J Neural Eng. 2017 Oct 5;14(6):066001. doi: 10.1088/1741-2552/aa7fc4. [Epub ahead of print]

OBJECTIVE: Typically, clinical measures of cognition require motor or speech responses. Thus, a significant percentage of people with disabilities are not able to complete standardized assessments. This situation could be resolved by employing a more accessible test administration method, such as a brain-computer interface (BCI). A BCI can circumvent motor and speech requirements by translating brain activity to identify a subject's response. By eliminating the need for motor or speech input, one could use a BCI to assess an individual who previously did not have access to clinical tests. **APPROACH:** We developed an asynchronous, event-related potential BCI-facilitated administration procedure for the peabody picture vocabulary test (PPVT-IV). We then tested our system in typically developing individuals ($N = 11$), as well as people with cerebral palsy ($N = 19$) to compare results to the standardized PPVT-IV format and administration. **MAIN RESULTS:** Standard scores on the BCI-facilitated PPVT-IV, and the standard PPVT-IV were highly correlated ($r = 0.95$, $p < 0.001$), with a mean difference of 2.0 ± 6.4 points, which is within the standard error of the PPVT-IV. **SIGNIFICANCE:** Thus, our BCI-facilitated PPVT-IV provided comparable results to the standard PPVT-IV, suggesting that populations for whom standardized cognitive tests are not accessible could benefit from our BCI-facilitated approach.

[PMID: 28981448](#)

10. Affective Stimuli for an Auditory P300 Brain-Computer Interface.

Onishi A, Takano K, Kawase T, Ora H, Kansaku K.

Front Neurosci. 2017 Sep 21;11:522. doi: 10.3389/fnins.2017.00522. eCollection 2017.

Gaze-independent brain computer interfaces (BCIs) are a potential communication tool for persons with paralysis. This study applies affective auditory stimuli to investigate their effects using a P300 BCI. Fifteen able-bodied participants operated the P300 BCI, with positive and negative affective sounds (PA: a meowing cat sound, NA: a screaming cat sound). Permuted stimuli of the positive and negative affective sounds (permuted-PA, permuted-NA) were also used for comparison. Electroencephalography data was collected, and offline classification accuracies were compared. We used a visual analog scale (VAS) to measure positive and negative affective feelings in the participants. The mean classification accuracies were 84.7% for PA and 67.3% for permuted-PA, while the VAS scores were 58.5 for PA and -12.1 for permuted-PA. The positive affective stimulus showed significantly higher accuracy and VAS scores than the negative affective stimulus. In contrast, mean classification accuracies were 77.3% for NA and 76.0% for permuted-NA, while the VAS scores were -50.0 for NA and -39.2 for permuted NA, which are not significantly different. We determined that a positive affective stimulus with accompanying positive affective feelings significantly improved BCI accuracy. Additionally, an ALS patient achieved 90% online

classification accuracy. These results suggest that affective stimuli may be useful for preparing a practical auditory BCI system for patients with disabilities.

[PMID: 28983235](#)

Prevention and Cure

11. Cerebral palsy after assisted reproductive technology: a cohort study.

Goldsmith S, McIntyre S, Badawi N, Hansen M.

Dev Med Child Neurol. 2017 Oct 4. doi: 10.1111/dmcn.13577. [Epub ahead of print]

AIM: To calculate the birth prevalence of cerebral palsy (CP) after assisted reproductive technology (ART) and compare the clinical outcomes of children with CP after ART or natural conception. **METHOD:** This cohort study used linked CP and ART register data from live births in Western Australia (1994-2002). Birth prevalence was calculated and data analysed using descriptive statistics and logistic regression. It was adjusted for confounding variables and stratified by plurality and gestational age. **RESULTS:** In total, 211 660 live births were included; prevalence of CP was increased in children born after ART (7.2/1000 live births compared with naturally conceived births, 2.5/1000). Odds of CP were doubled for singletons; when stratified by gestational age odds were only increased in the under 32-week group. Prevalence of CP was increased in ART (9.9/1000 live births) and naturally conceived twins (8.4/1000 live births). Clinical outcomes were similar between ART and naturally conceived children. **INTERPRETATION:** The birth prevalence of CP is increased two-fold after ART. After stratification for gestational age and plurality, residual risk remains in singletons born very preterm. Birth prevalence of CP will be tracked over time to identify any impact of changes to clinical practice. **WHAT THIS PAPER ADDS:** In Western Australia, assisted reproductive technology (ART) increases birth prevalence of cerebral palsy (CP), mediated mostly by preterm and multiple births. Preterm birth alone does not account for the doubled odds of CP for ART singletons born very preterm. Clinical outcomes are similar between ART and naturally conceived children with CP.

[PMID: 28980316](#)

12. Implementation of Early Diagnosis and Intervention Guidelines for Cerebral Palsy in a High-Risk Infant Follow-Up Clinic.

Byrne R, Noritz G, Maitre NL; NCH Early Developmental Group.

Pediatr Neurol. 2017 Aug 30. pii: S0887-8994(17)30782-8. doi: 10.1016/j.pediatrneurol.2017.08.002. [Epub ahead of print]

BACKGROUND: Cerebral palsy is the most common physical disability in childhood, and is mostly diagnosed after age 2 years. Delays in diagnosis can have negative long-term consequences for children and parents. New guidelines for early cerebral palsy diagnosis and intervention were recently published, after systematic review of the evidence by international multidisciplinary experts aiming to decrease age at diagnosis. The current study tested the feasibility of implementing these guidelines in an American clinical setting. **METHODS:** We designed a stepwise implementation process in a neonatal intensive care follow-up clinic. Efficacy was tested by comparing 10-month pre- and post-implementation periods. Clinic visit types, cerebral palsy diagnosis, provider competencies and perspectives, and balancing measures were analyzed. **RESULTS:** Changes to infrastructure, assessments, scheduling algorithms, documentation and supports in diagnosis or counseling were successfully implemented. Number of three- to four-month screening visits increased (255 to 499, $P < 0.001$); mean age at diagnosis decreased (18 to 13 months, $P < 0.001$). Clinic team awareness of early diagnosis and interventions increased ($P < 0.001$). There was no decrease in family satisfaction with overall clinic function. Opportunities for improvements included documentation for transitioning patients, generalizability across hospital clinics, systematic identification of high-risk status during hospitalization, and need for cerebral palsy care guidelines for infants under age 2 years. **CONCLUSIONS:** We demonstrated for the first time in a US clinical setting the feasibility of implementation of international early diagnosis and treatment guidelines for cerebral palsy. This process is adaptable to other settings and underscores the necessity of future research on cerebral palsy treatments in infancy.

[PMID: 28982529](#)

13. Assessing the neuroprotective benefits for babies of antenatal magnesium sulphate: An individual participant data meta-analysis.

Crowther CA, Middleton PF, Voysey M, Askie L, Duley L, Pryde PG, Marret S, Doyle LW; AMICABLE Group.

PLoS Med. 2017 Oct 4;14(10):e1002398. doi: 10.1371/journal.pmed.1002398. eCollection 2017 Oct.

BACKGROUND: Babies born preterm are at an increased risk of dying in the first weeks of life, and those who survive have a higher rate of cerebral palsy (CP) compared with babies born at term. The aim of this individual participant data (IPD) meta-analysis (MA) was to assess the effects of antenatal magnesium sulphate, compared with no magnesium treatment, given to women at risk of preterm birth on important maternal and fetal outcomes, including survival free of CP, and whether effects differed by participant or treatment characteristics such as the reason the woman was at risk of preterm birth, why treatment was given, the gestational age at which magnesium sulphate treatment was received, or the dose and timing of the administration of magnesium sulphate. **METHODS AND FINDINGS:** Trials in which women considered at risk of preterm birth (<37 weeks' gestation) were randomised to magnesium sulphate or control treatment and where neurologic outcomes for the baby were reported were eligible for inclusion. The primary outcomes were infant death or CP and severe maternal outcome potentially related to treatment. Studies were identified based on the Cochrane Pregnancy and Childbirth search strategy using the terms [antenatal or prenatal] and [magnesium] and [preterm or premature or neuroprotection or 'cerebral palsy']. The date of the last search was 28 February 2017. IPD were sought from investigators with eligible trials. Risk of bias was assessed using criteria from the Cochrane Collaboration. For each prespecified outcome, IPD were analysed using a 1-stage approach. All 5 trials identified were included, with 5,493 women and 6,131 babies. Overall, there was no clear effect of magnesium sulphate treatment compared with no treatment on the primary infant composite outcome of death or CP (relative risk [RR] 0.94, 95% confidence interval (CI) 0.85 to 1.05, 6,131 babies, 5 trials, $p = 0.07$ for heterogeneity of treatment effect across trials). In the prespecified sensitivity analysis restricted to data from the 4 trials in which the intent of treatment was fetal neuroprotection, there was a significant reduction in the risk of death or CP with magnesium sulphate treatment compared with no treatment (RR 0.86, 95% CI 0.75 to 0.99, 4,448 babies, 4 trials), with no significant heterogeneity ($p = 0.28$). The number needed to treat (NNT) to benefit was 41 women/babies to prevent 1 baby from either dying or having CP. For the primary outcome of severe maternal outcome potentially related to magnesium sulphate treatment, no events were recorded from the 2 trials providing data. When the individual components of the composite infant outcome were assessed, no effect was seen for death overall (RR 1.03, 95% CI 0.91 to 1.17, 6,131 babies, 5 trials) or in the analysis of death using only data from trials with the intent of fetal neuroprotection (RR 0.95, 95% CI 0.80 to 1.13, 4,448 babies, 4 trials). For cerebral palsy in survivors, magnesium sulphate treatment had a strong protective effect in both the overall analysis (RR 0.68, 95% CI 0.54 to 0.87, 4,601 babies, 5 trials, NNT to benefit 46) and the neuroprotective intent analysis (RR 0.68, 95% CI 0.53 to 0.87, 3,988 babies, 4 trials, NNT to benefit 42). No statistically significant differences were seen for any of the other secondary outcomes. The treatment effect varied little by the reason the woman was at risk of preterm birth, the gestational age at which magnesium sulphate treatment was given, the total dose received, or whether maintenance therapy was used. A limitation of the study was that not all trials could provide the data required for the planned analyses so that combined with low event rates for some important clinical events, the power to find a difference was limited. **CONCLUSIONS:** Antenatal magnesium sulphate given prior to preterm birth for fetal neuroprotection prevents CP and reduces the combined risk of fetal/infant death or CP. Benefit is seen regardless of the reason for preterm birth, with similar effects across a range of preterm gestational ages and different treatment regimens. Widespread adoption worldwide of this relatively inexpensive, easy-to-administer treatment would lead to important global health benefits for infants born preterm.

[PMID: 28976987](https://pubmed.ncbi.nlm.nih.gov/28976987/)

14. Congenital anomalies and the severity of impairments for cerebral palsy.

Jystad KP, Strand KM, Bjellmo S, Lydersen S, Klungsøy K, Stoknes M, Skranes J, Andersen GL, Vik T.

Dev Med Child Neurol. 2017 Oct 2. doi: 10.1111/dmcn.13552. [Epub ahead of print]

AIM: To study the prevalence of congenital anomalies among children with cerebral palsy (CP) born at term or late preterm, and if CP subtypes and clinical manifestations differ between children with and without congenital anomalies. **METHOD:** This was a cross-sectional study using data from the Cerebral Palsy Register of Norway and the Medical Birth Registry of Norway. All children with congenital CP born at and later than 34 weeks' gestation in Norway from 1999 to 2009 were included. Anomalies were classified according to the European Surveillance of Congenital Anomalies classification guidelines. Groups were compared using Fisher's exact test, Kruskal-Wallis test, and the Mann-Whitney U test. **RESULTS:** Among 685 children with CP, 169 (25%) had a congenital anomaly; 125 within the central nervous system. Spastic bilateral CP was more prevalent in children with anomalies (42%) than in children without (34%; $p=0.011$). Children with anomalies less frequently had low Apgar scores ($p<0.001$), but more often had severe limitations in gross- and fine-motor function, speech impairments, epilepsy,

severe vision, and hearing impairments than children without anomalies ($p < 0.03$). INTERPRETATION: Although children with CP and anomalies had low Apgar scores less frequently, they had more severe limitations in motor function and more associated problems than children with CP without anomalies. WHAT THIS PAPER ADDS: One in four children with cerebral palsy (CP) born at term or late preterm has a congenital anomaly. The added value of neuroimaging to detect central nervous system anomalies in children with CP. Children with anomalies have more severe motor impairments. More severe clinical manifestations are not explained by perinatal complications as indicated by low Apgar scores.

[PMID: 28967231](#)

15. Development of a Cerebral Palsy Follow-up Registry in Jordan (CPUP-Jordan).

Almasri NA, Saleh M, Abu-Dahab S, Malkawi SH, Nordmark E.

Child Care Health Dev. 2017 Oct 6. doi: 10.1111/cch.12527. [Epub ahead of print]

AIMS: This study aims to describe the development of a Cerebral Palsy Follow-up Registry in Jordan (CPUP-Jordan) and to provide a baseline child and parent demographic information, birth history of the child participants, and distribution of the participants based on topographical distribution of cerebral palsy (CP) and functional classification systems. METHODS: The CPUP-Jordan was developed using a similar framework of a follow-up surveillance programme for persons with CP in Sweden (CPUP). Standard assessment forms were utilized to collect data related to child and family demographics, child birth history, and functional classifications and physiotherapy and occupational therapy assessments and interventions. Research assistants were trained to conduct the assessments. A secured web-based system was developed to store data and disseminate knowledge maintained in the registry. Children with CP were included in the registry if they have confirmed diagnosis of CP. The ascertainment age of inclusion and the minimum age of survival required are 4 years. RESULTS: One hundred sixty-seven children were registered between 2013 and 2015 (mean age is 3.6 ± 3.0 years). Forty-two percent were born premature, and 48% were less than the normal birthweight. Perinatal causes were reported for 54% of the participants. The most common type of CP based on tone disturbance was spastic type, and the most common topographical distributions of motor dysfunction were quadriplegia followed by diplegia. Fifty-six percent of the participants had severe limitation in ambulation; 48% had restricted manual abilities, and 47% had limited communication abilities even with familiar family members and partners. CONCLUSIONS: The development of CPUP-Jordan registry for children with CP proved to be both feasible and informative. The registry baseline descriptive data were similar to those reported in previous research in Jordan supporting validity of the data. The implementation of CPUP-Jordan at national level is expected to have a positive impact on children with CP, clinicians, policymakers, and researchers.

[PMID: 28983951](#)

16. Twin Studies in Brazil: Projects and Plans / Twin Research: Infant Twins' Viewing of Social Scenes; Religiosity and Substance Abuse; Down Syndrome Among Twins; Twin Case of Chronic Periodontitis / In the News: The Twin 'Property Brothers', Twins With Cerebral Palsy; Twins Affected With the Zika Virus; Twin Writers Derek and Roddy; Twins on Sports Teams; Local Quads.

Segal NL.

Twin Res Hum Genet. 2017 Oct;20(5):481-488. doi: 10.1017/thg.2017.50.

Twin research in Brazil twin has expanded enormously in recent years, engaging the interests and efforts of many investigators, students and twins. Descriptions and brief summaries of this work and talks given by investigators at local conferences are presented, based on my four-city lecture tour. This is followed by summaries of twin research on infants' viewing of social scenes, religiosity and substance abuse, Down syndrome, and chronic periodontitis. This article concludes with twin-related news and information of general interest, including identical twin property designers, twins with cerebral palsy, twins affected with the Zika virus, a pair of twin writers, twins in sports, and a set of quadruplets from my childhood neighborhood in Riverdale, New York.

[PMID: 28975876](#)

17. MLEC gene polymorphisms promote cerebral palsy via M2-like macrophage polarization.

Shi W, Zhu Y, Zhou M, Ruan Y, Chen X, Chen X.

Clin Genet. 2017 Oct 3. doi: 10.1111/cge.13149. [Epub ahead of print]

The relationship between gene polymorphisms and the pathogenesis of cerebral palsy (CP) is uncovering recently. Here, we suggested that single nucleotide polymorphisms (SNPs) of MLEC gene might take part in the pathogenesis of CP. We genotyped and analyzed six SNP positions of MLEC gene in 916 CP patients and 957 healthy people, which are from the Chinese Han population. The results indicated significant associations between the risk of CP and rs10431386 (allele: p-value = 0.006, odds ratio (OR) = 1.587, 95% confidence interval (CI) = 1.198-1.967) and rs7964786 (allele: p-value = 0.005, OR=1.956, 95% CI=1.238-2.519) SNP positions of MLEC gene. Further investigations revealed that C alleles of rs10431386 and rs7964786 inhibit the expression of MLEC in blood of CP patients and macrophage cell line. In vitro experiments revealed that MLEC promotes M1 to M2 macrophage polarization. The results of in vitro studies suggest that C alleles of rs10431386 and rs7964786 on MLEC promotes CP by inhibiting M1 to M2 macrophage polarization. Generally, this work suggested the contribution of MLEC gene polymorphisms to the pathogenesis of CP.

[PMID: 28972276](#)**18. Severe gyration and migration disorder in fetofetal transfusion syndrome: two case reports and a review of the literature on the neurological outcome of children with lesions on neuroimaging.**

Ascherl R, Sorge I, Thome U, Hirsch FW, Bläser A, Kiess W, Merckenschlager A.

Childs Nerv Syst. 2017 Oct 2. doi: 10.1007/s00381-017-3595-7. [Epub ahead of print]

INTRODUCTION: Fetofetal transfusion syndrome is a dreaded cause of morbidity and mortality in monochorionic pregnancies. **CASE REPORTS:** We present two pairs of twins one of which we have followed for more than 6 years. The donors suffer from cerebral palsy, orofacial, and motor problems, and both are significantly smaller than their recipient twins. Interestingly, cranial MRI revealed medial frontal lobe polymicrogyria, ventriculomegaly, and decreased thickness in both parietal lobes in both donors. We suggest this as a possible feature of fetofetal transfusion syndrome. **REVIEW:** A minireview of the literature on neuroimaging and neurodevelopmental outcome in fetofetal transfusion syndrome is presented. **CONCLUSION:** While the close resemblance of the imaging features of both cases is likely incidental further study of a connection between migration and gyration disorders and fetofetal transfusion syndrome is warranted.

[PMID: 28971247](#)**19. Korean Database of Cerebral Palsy: A Report on Characteristics of Cerebral Palsy in South Korea.**

Yim SY, Yang CY, Park JH, Kim MY, Shin YB, Kang EY, Lee ZI, Kwon BS, Chang JC, Kim SW, Kim MO, Kwon JY, Jung HY, Sung IY; Society of Pediatric Rehabilitation and Developmental Medicine, Korea..

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OBJECTIVE: To introduce the Korean Database of Cerebral Palsy (KDCP) and to provide the first report on characteristics of subjects with cerebral palsy (CP). **METHODS:** The KDCP is a nationwide database of subjects with CP, which includes a total of 773 subjects. Characteristics such as demography, birth history, onset and type of CP, brain magnetic resonance imaging (MRI) findings, functional ability and accompanying impairments, were extracted and analyzed. **RESULTS:** Preterm delivery and low birth weight were found in 59.51% and 60.28% of subjects, respectively. Postnatally acquired CP was 15.3%. The distribution of CP was 87.32%, 5.17%, and 1.81% for spastic, dyskinetic, and ataxic types, respectively. Functional ability was the worst in dyskinetic CP, as compared to other types of CP. Speech-language disorder (43.9%), ophthalmologic impairment (32.9%), and intellectual disability (30.3%) were the three most common accompanying impairments. The number of accompanying impairments was elevated in subjects with preterm birth and low birth weight. Brain MRI showed normal findings, malformations, and non-malformations in 10.62%, 9.56%, and 77.35% of subjects, respectively. Subjects with normal MRI findings had better functional ability than subjects with other MRI findings. MRI findings of a non-malformation origin, such as periventricular leukomalacia, were more common in subjects with preterm birth and low birth weight. **CONCLUSION:** The KDCP and its first report are introduced in this report, wherein the KDCP established agreement on terminologies of CP. This study added information on the characteristics of subjects with CP in South Korea, which can now be compared to those of other countries and ethnicities.

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